

What is claimed is:

1. An optical disc including a data area and a time map area,  
the data area recording a video object that includes a plurality of data units, each of which contains at least one  
5 picture; the first picture of each of the plurality of data units being an Intra Picture that can be separately reproduced,  
the time map area recording a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times, and  
10 the table recording data sizes of the Intra Pictures in correspondence with the plurality of data units.
- 15 2. The optical disc of Claim 1 further including  
a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section  
20 in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.
- 25 3. The optical disc of Claim 1, wherein  
the table further records difference times, each of which corresponds to one of the plurality of reproduction times and  
is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.
- 30 4. A recording apparatus for recording video data onto an

optical disc, comprising:

an input unit operable to receive input video data to be recorded;

a compressing unit operable to compress the input video data and generate a video object containing a plurality of data units, each of which contains at least one picture, the first picture of each of the plurality of data units being an Intra Picture that can be separately reproduced;

10 a writing unit operable to write data onto the optical disc; and

15 a control unit operable to control the writing unit, wherein

the control unit

- (a) controls the writing unit to write the video object onto the data area of the optical disc,
- (b) generates a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times, and
- (c) controls the writing unit to write the table into a time map area of the optical disc.

25 5. The reproducing apparatus of Claim 4, wherein the optical disc further includes

a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section  
30 in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

6. The reproducing apparatus of Claim 4, wherein  
the table further records difference times, each of which  
corresponds to one of the plurality of reproduction times and  
5 is a difference between the one of the plurality of reproduction  
times and a reproduction time of the first picture of a data  
unit that includes a picture to be reproduced at the one of  
the plurality of reproduction times.

10 7. A recording method for use in a recording apparatus for  
recording onto an optical disc a video object containing a  
plurality of data units, each of which contains at least one  
picture, the first picture of each of the plurality of data  
units being an Intra Picture that can be separately reproduced,  
the recording method comprising the steps of:

writing the video object onto a data area of the optical  
disc;

generating a table showing recording addresses of data  
units, the addresses corresponding to a plurality of  
20 reproduction times that belong to a period during which the  
video object is reproduced, each of the data units containing  
a picture to be reproduced at a corresponding one of the  
plurality of reproduction times; and

writing the table onto a time map area of the optical disc.

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8. The recording method of Claim 7, wherein the optical disc  
further includes

a program chain area that records a plurality of sets  
of cell information, each of which includes a start time and  
30 an end time which are used to identify a reproduction section  
in the video object, the plurality of sets of cell information

being recorded in correspondence with reproduction orders.

9. The recording method of Claim 7, wherein

the table further records difference times, each of which

5 corresponds to one of the plurality of reproduction times and  
is a difference between the one of the plurality of reproduction  
times and a reproduction time of the first picture of a data  
unit that includes a picture to be reproduced at the one of  
the plurality of reproduction times.

10. A reproducing apparatus for reproducing the video object  
recorded on the optical disc defined in Claim 1, the reproducing  
apparatus comprising:

15 a reading unit operable to read data from the optical  
disc;

a reproducing unit operable to reproduce the video  
object; and

20 a control unit operable to control the reading unit and  
the reproducing unit, wherein

the control unit

(a) receives an instruction to reproduce at high speed,  
(b) determines a plurality of reproduction times with a  
predetermined time interval in between, in accordance  
with the received instruction,

25 (c) controls the reading unit to read the table,

(d) refers to the read table and identifies, for each of the  
plurality of reproduction times, (a) a recording address  
and (b) a data size of an Intra Picture, and

30 (e) controls the reading unit and the reproducing unit to read  
and reproduce Intra Pictures corresponding to the  
plurality of reproduction times.

11. The reproducing apparatus of Claim 10, wherein the optical disc further includes

5 a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

10 12. The reproducing apparatus of Claim 10, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

15 13. A reproduction method for use in a reproducing apparatus including (a) a reading unit operable to read data from the 20 optical disc defined in Claim 1 and (b) a reproducing unit operable to reproduce a video object, the reproduction method comprising the steps of

- 25 (a) receiving an instruction to reproduce at high speed,  
(b) determining a plurality of reproduction times with a predetermined time interval in between, in accordance with the received instruction,  
(c) controlling the reading unit to read the table,  
(d) referring to the read table and identifying, for each of the plurality of reproduction times, (a) a recording address and (b) a data size of an Intra Picture, and  
30 (e) controlling the reading unit and the reproducing unit to

read and reproduce Intra Pictures corresponding to the plurality of reproduction times.

14. The reproduction method of Claim 13, wherein the optical disc further includes

a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

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15. The reproduction method of Claim 13, wherein the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

- 20 16. A computer-readable recording medium recording a program for use in a recording apparatus for recording onto an optical disc a video object containing a plurality of data units, each of which contains at least one picture, the first picture of each of the plurality of data units being an Intra Picture that can be separately reproduced, the program allowing a computer to execute the steps of:

25 writing the video object onto a data area of the optical disc;

30 generating a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the

video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times; and

writing the table onto a time map area of the optical disc.

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17. The computer-readable recording medium of Claim 16, wherein the optical disc further includes

a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

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18. The computer-readable recording medium of Claim 16, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

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19. A computer-readable recording medium for use in a reproducing apparatus including (a) a reading unit operable to read data from the optical disc defined in Claim 1 and (b) a reproducing unit operable to reproduce a video object, the program allowing a computer to execute the steps of

(a) receiving an instruction to reproduce at high speed,  
(b) determining a plurality of reproduction times with a predetermined time interval in between, in accordance with the received instruction,

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(c) controlling the reading unit to read the table,  
(d) referring to the read table and identifying, for each of  
the plurality of reproduction times, (a) a recording  
address and (b) a data size of an Intra Picture, and  
5 (e) controlling the reading unit and the reproducing unit to  
read and reproduce Intra Pictures corresponding to the  
plurality of reproduction times.

20. The computer-readable recording medium of Claim 19,  
10 wherein the optical disc further includes

15 a program chain area that records a plurality of sets  
of cell information, each of which includes a start time and  
an end time which are used to identify a reproduction section  
in the video object, the plurality of sets of cell information  
being recorded in correspondence with reproduction orders.

21. The computer-readable recording medium of Claim 19,  
wherein

20 the table further records difference times, each of which  
corresponds to one of the plurality of reproduction times and  
is a difference between the one of the plurality of reproduction  
times and a reproduction time of the first picture of a data  
unit that includes a picture to be reproduced at the one of  
the plurality of reproduction times.